

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

Claim 1 (canceled).

2. (currently amended)An Asynchronous Transfer Mode (ATM) communication apparatus which is connected to a plurality of input lines and a plurality of output lines and transmits a cell received from each of the input lines to one of the plurality of output lines, which is specified by connection identification information included in a header of the cell, comprising:

a buffer memory for temporarily storing cells received from each of the input lines;

a write control unit for writing the cells received from each of the input lines into the buffer memory so that cells stored in the buffer memory form cell queues corresponding to connections for each output line;

a read control unit for reading out cells from each of cell queues formed in the buffer memory while guaranteeing a minimum cell rate predetermined for each connection within a range not exceeding a predetermined peak cell rate; and

means for adding congestion indication to a cell read out from a cell queue of which stored cell amount exceeds a preset threshold~~communication apparatus~~

~~according to claim 1,~~

wherein the read control unit comprises:

a guaranteed bandwidth table in which information for allocating time slots to each of a plurality of connections multiplexed on the output line while guaranteeing a minimum cell rate is stored for each of the output lines;_i

a shared bandwidth table in which information indicative of an allocation range of idle time slots allowed to each of the connections multiplexed is stored for each of the output lines;_i and

means for determining a connection for which a cell is to be read out by referring to the shared bandwidth table in a time slot which enters an idle state since there is no cell to be transmitted in a cell queue in a connection designated by the guaranteed bandwidth table and an idle time slot to which a connection is not designated in the guaranteed bandwidth table.

3. (original) An ATM communication apparatus according to claim 2, further comprising:

a flag table in which the presence or absence of a stored cell in each of the connections multiplexed is indicated by a flag bit for each of the output lines,

wherein a flag bit train indicative of the number of idle time slots allocatable to each of the connections multiplexed is stored as the information in the shared bandwidth table, and

wherein the connection determining means determines a connection for which a cell is to be read on the basis of a result of an operation performed between a group of flag bits arranged in accordance with the order of connections indicated by

the flag table and a group of flag bits arranged in accordance with the order of connections extracted from the shared bandwidth table.

4. (original) An ATM communication apparatus according to claim 2, wherein the connection determining means has means for avoiding successive allocation of idle time slots to the same connection.

5. (original) An ATM communication apparatus according to claim 3, wherein the connection determining means has means for avoiding successive allocation of idle time slots to the same connection.

6. (currently amended) An Asynchronous Transfer Mode (ATM) communication apparatus which is connected to a plurality of input lines and a plurality of output lines and transmits a cell received from each of the input lines to one of the plurality of output lines, which is specified by connection identification information included in a header of the cell, comprising:

a buffer memory for temporarily storing cells received from each of the input lines;

a write control unit for writing the cells received from each of the input lines into the buffer memory so that cells stored in the buffer memory form cell queues corresponding to connections for each output line;

a read control unit for reading out cells from each of cell queues formed in the buffer memory while guaranteeing a minimum cell rate predetermined for each connection within a range not exceeding a predetermined peak cell rate; and
means for adding congestion indication to a cell read out from a cell queue of which stored cell amount exceeds a preset threshold~~communication apparatus according to claim 4,~~

wherein the write control unit has means for selectively discarding not only a received cell which becomes unable to be written into the buffer memory but also subsequent received cells belonging to the same connection as the cell failed to be written into the buffer memory.

7. (currently amended)An Asynchronous Transfer Mode (ATM)
~~communication apparatus according to claim 4~~communication apparatus which is connected to a plurality of input lines and a plurality of output lines and transmits a cell received from each of the input lines to one of the plurality of output lines, which is specified by connection identification information included in a header of the cell, comprising:

a buffer memory for temporarily storing cells received from each of the input lines;

a write control unit for writing the cells received from each of the input lines into the buffer memory so that cells stored in the buffer memory form cell queues corresponding to connections for each output line;

a read control unit for reading out cells from each of cell queues formed in the buffer memory while guaranteeing a minimum cell rate predetermined for each connection within a range not exceeding a predetermined peak cell rate; and
means for adding congestion indication to a cell read out from a cell queue of which stored cell amount exceeds a preset threshold,

wherein the write control unit has means for selectively discarding a received cell which becomes unable to be written to the buffer memory, a cell which belongs to the same connection as the received cell and has been already stored, and a subsequent received cell belonging to the same connection as the first mentioned received cell.

8. (currently amended)An Asynchronous Transfer Mode (ATM)
~~communication apparatus according to claim 1~~communication apparatus which is connected to a plurality of input lines and a plurality of output lines and transmits a cell received from each of the input lines to one of the plurality of output lines, which is specified by connection identification information included in a header of the cell, comprising:

a buffer memory for temporarily storing cells received from each of the input lines;

a write control unit for writing the cells received from each of the input lines into the buffer memory so that cells stored in the buffer memory form cell queues corresponding to connections for each output line;

a read control unit for reading out cells from each of cell queues formed in the buffer memory while guaranteeing a minimum cell rate predetermined for each connection within a range not exceeding a predetermined peak cell rate; and
means for adding congestion indication to a cell read out from a cell queue of which stored cell amount exceeds a preset threshold,

wherein the write control unit has means for selectively discarding received cells belonging to the same packet to which a preceding received cell which becomes unable to be written to the buffer memory belongs.

Claims 9 and 10 (canceled).